



# Associations Between Callous-Unemotional Traits and Peer-Rated Social-Behavioral Outcomes in Elementary and Middle School

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Published online: 17 March 2020

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## Abstract

There is strong evidence that peers are of central importance to children's and adolescents' social and emotional adaptation and success in school. However, it remains an open question as to whether callous-unemotional (CU) traits, or interpersonal and affective deficits that pose risk for antisocial behaviors and psychopathy, are related to social-behavioral outcomes as assessed by those who are believed to have the most accurate perspectives on such outcomes – young adolescents' peers. Using data from a longitudinal and multi-method study of peer relations ( $N = 379$ , % female = 51.90,  $M_{\text{age}} = 10.24$  at Time 1), the current study addressed this gap by examining the links between teacher-reports of CU traits and conduct problems (CP) and peer-reports of the extent to which young adolescents are aggressive, victimized, excluded, prosocial, and sociable during the Fall and Spring semesters in Grade 5 (Times 1 and 2) and Grade 6 (Times 3 and 4). Results revealed that teacher-rated CP, but not CU traits, was associated positively with peer-reports of aggression. CU traits, but not CP, was associated positively with victimization/exclusion and associated negatively with prosociality. CU traits and CP demonstrated opposite relations with sociability, with CU traits demonstrating a negative association. Findings are discussed in the context of the broader literature examining the social-behavioral correlates of CU traits.

**Keywords** Callous-unemotional traits · Social-behavioral outcomes · Conduct problems

Social interactions with peers represent an important context for social exchange which fundamentally shapes social, emotional, and cognitive adaptation across development (Rubin et al. 2015; see Bukowski et al. 2018 for extensive reviews). Peer interactions are characterized by a unique symmetrical power dynamic which affords children the opportunity to develop such social-cognitive skills as social information processing, theory of mind, and advanced moral reasoning. In addition, peer interaction is implicated in the development of social competence (Rubin et al. 2015). These interactions, which contribute to the initiation and maintenance of close

dyadic and group relationships, are widely regarded as significant developmental achievements (Hinde 1987). For example, those children who experience problematic peer interactions (i.e., in the form of victimization or repeated peer rejection), rather than positive peer interchanges, not only miss out on opportunities for positive adjustment and growth (Bukowski and Vitaro 2018), but are at a greater risk for such negative outcomes as delinquency and substance use and abuse (Dishion and Patterson 2016). Moreover, whether a child will have access to healthy and adaptive social interactions is dependent, in part, on variation in intrapersonal child personality and behavioral characteristics, not least of which include externalizing symptoms (Haas et al. 2017). Indeed, conduct problems (CP), which are characterized by oppositional defiant and conduct disordered behaviors such as aggression (i.e., hitting, kicking, physically fighting with others), are associated with a broad range of socio-emotional impairments, including emotion dysregulation, information processing and other social-cognitive deficits, peer rejection, and friendship difficulties (Gardner and Gerdes 2015).

To develop more targeted and effective treatment and support strategies, researchers have focused on identifying homogenous subgroups of youth with CP. Specifically,

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researchers have shown that callous-unemotional (CU) traits, which describe deficits in guilt, empathy, prosociality, and an excess of shallow affect as well as a lack of remorse, are useful for understanding the heterogeneity in CP and are predictive of stable and severe patterns of offending and psychopathy (Frick et al. 2014; Willoughby et al. 2014). Individuals with psychopathy display reduced motivation and capacity to develop mutually beneficial and authentic social relationships (Viding and McCrory 2019), and these same theoretical processes have been extended to CU traits (Waller and Wagner 2019). And yet, despite the assumption that interpersonal, affective, and social deficits are key features of CU traits (Dadds and Frick 2019; Wagner et al. 2020), few researchers have examined the social interaction correlates of CU traits from the perspectives of children's and young adolescents' class- and grade-mates. As generally acknowledged in peer relations research (e.g., Cillessen and Bukowski 2018), reports of school-mates are considered a "gold standard" for the assessment of youths' social experiences. This is seen to be the case given that peers are oftentimes privy to social behaviors and experiences (e.g., bullying; victimization) that occur away from, and beyond the view of adults and teachers (e.g., bullying is more likely to occur on the school playground than in the classroom) (Craig et al. 2000).

The transition to middle school, which occurs during a developmental period characterized by significant physical, cognitive and social change (e.g., the onset of puberty), coincides with declines in achievement and self-esteem, and increases in psychological distress (Eccles and Midgley 1989). This transition is a critical time during which youth move from the familiarity of elementary school into larger, unfamiliar middle schools that may prove particularly challenging and stressful (Eccles and Midgley 1989; Oh et al. 2008). Research shows that peer interactions and relationships have substantial influences on various aspects of school adjustment across the transition to middle school (Rubin et al. 2015), and problematic peer experiences may represent important mediating mechanisms linking individual child risk factors and later psychosocial difficulties, during childhood and also across the transition from elementary-to-middle school (e.g., Gazelle and Ladd 2003).

The current study aims to contribute to the extant literature by examining the unique associations between CP and CU traits and peer reports of such significant social behaviors and processes as aggression, victimization and peer exclusion, prosociality, and sociability, as youth navigate the elementary-to-middle school transition (5th and 6th grades). In so doing, this research represents a first step toward understanding the social-behavioral correlates of CU traits *as perceived by their peers* in elementary and middle school, thereby providing new clues regarding possible *peer* targets for intervention, which have been leveraged successfully in other areas of research (Gardner and Gerdes 2015).

## Conduct Problems, Callous-Unemotional Traits, and Social Relationships

Children's aggressive behavior constitutes a significant individual child risk factor for problematic peer processes (see Malti and Rubin 2018 for relevant reviews). For example, researchers have found that children who enter elementary school demonstrating aggressive or disruptive behaviors are often disliked, rejected, and victimized by their peers, decreasing the opportunities for positive peer socialization (e.g., Vitaro et al. 2018). Longitudinal studies also show bidirectional associations between aggression and victimization, suggesting that aggressive youth are often behave provocatively and consequently are victimized by their peers. In turn, for these youth, victimization contributes to increased peer hostility and aggressive behavior (Salmivalli and Peets 2018). However, by the transition to adolescence, aggressive children begin to form relationships with each other, often reinforcing behavior problems and altering peer perceptions of them (Dishion et al. 2016). It is also during adolescence when many aggressive behaviors become viewed more positively and as assertive, confident, and "authority-defying" by youth who are struggling with the *maturity gap* or the gap between one's biological and socially-prescribed age (Bukowski and Sippola 2001; Moffitt 1993). As such, research on youths' perceptions of the behaviors of children high on aggression and other related behavioral problems (e.g., delinquency; substance use) across the elementary and middle school years indicates that many aggressive youths are not only perceived to be aggressive but also as increasingly popular and sociable (Bowker et al. 2010).

Although research on whether and how the socioemotional and interpersonal characteristics of CU traits are perceived by peers is lacking, there is a growing body of literature suggesting that CU traits are associated with poor peer functioning beyond the negative impact of impulsive and aggressive behaviors (Andrade et al. 2014; Waschbusch and Willoughby 2008). For example, in a study of 11–13-year-olds, CU traits were associated with higher levels of peer-reported bullying behavior, above and beyond the impact of CP (Viding et al. 2009). Furthermore, Haas and colleagues found that CU traits among elementary school-aged children were associated with reduced social competence across multiple raters, increased feelings of loneliness, and poorer quality friendships, when controlling for externalizing behavior problems and other demographic variables (Haas et al. 2017). Available evidence using self-report shows that youth high on CU traits are more likely to affiliate with delinquent peers (Kimonis et al. 2004), and CU traits have been shown to be reciprocally related to self-reports of peer rejection (or active peer dislike; Barker and Salekin 2012a, b). And, a longitudinal study of nearly 10,000 children showed that trajectories of teacher-rated CU traits from ages 7 to 12 years old were predictive of later reports of peer problems (Fontaine et al. 2011). Furthermore, teacher-

reports of CU traits have been associated negatively with teacher-report measures of prosocial behaviors for both boys and girls (Milledge et al. 2018). The current study extends this work by examining *peer* perceptions of the social-behavioral outcomes of children high on CU traits during the transition from elementary to middle school.

The limited research examining the link between CU traits and peer interactions and relationships seems to be consistent with work elucidating the phenotypic correlates of CU traits, including research showing associations between CU traits and the potential for increased aggression, increased victimization, and lower prosociality in peer contexts (Barker and Salekin 2012a, b; Fanti et al. 2009; Haas et al. 2017; Helseth et al. 2015; Kimonis et al. 2004). However, this small, yet growing, body of research has not been extended to test the *peer*-rated social and relational (e.g., popularity, sociability) correlates of CU traits. The available evidence to support hypotheses regarding these relations is mixed. For example, consistent with theoretical accounts identifying reduced affiliative reward and deficits in social functioning as being core to the emergence of CU traits (Dadds and Frick 2019; Viding and McCrory 2019), there is research linking CU traits with reduced attention to emotional faces, the lack of eye contact during social interactions, and the relative lack of reciprocal smiling and warmth in infancy and toddlerhood. These findings may suggest the potential for behaviors that are indicators of a lack of sociability in the school context (Bedford et al. 2014; Wagner et al. 2016). On the other hand, interpersonal and emotional correlates of adult psychopathy, for which CU traits is a risk factor (Barry et al. 2000), include superficial charm, manipulation, and grandiosity (Hare and Neumann 2008). A downward extension of this literature might suggest that peers would perceive those individuals high on CU traits as particularly sociable, but lacking in other forms of positive peer interaction such as prosociality (i.e., helping, caring, and sharing). Indeed, limited research on the links between social cognition and CU traits suggests that these children accurately interpret their peers' actions (Frick et al. 2003) and are capable of generating appropriate solutions to social problems (Waschbusch et al. 2007), but also place higher value on, and expect more gain from, antisocial responses to social situations (Pardini et al. 2003).

Links between children's CP and poor peer functioning are well documented, and there is growing evidence that CU traits also confer increased risk for poor peer functioning in elementary school. However, researchers have yet to examine the associations between CU traits and children's social behaviors in the classroom and their peer status and relationships as assessed by their *peers*. Using data from a longitudinal study of peer relations, the current investigation addressed this gap in the literature by examining the links between teacher-reports of children's CP and CU traits and peer reports of the extent to which children are aggressive, victimized and

excluded, prosocial, and sociable. Youth were assessed during the Fall and Spring semesters in each of the 5th and 6th grades. Guided by theory and research on the consequences of CP for peer relations in older childhood (e.g., Powers and Bierman 2013), we hypothesized that teacher-rated CP would be associated positively with peer ratings of aggression and sociability. While the literature on CU traits and peer relationships is not adequately developed to provide concrete hypotheses regarding peers' perceptions of social-behavioral outcomes associated with CU traits, existing literature seems to support the possibility that teacher-rated CU traits would be associated with peer ratings of higher aggression, victimization and exclusion, and sociability, but lower prosociality.

## Method

### Participants

Participants included 379 children who participated in a longitudinal study in Grade 5 (the last year of elementary school; 48% female;  $M_{age} = 10.24$  at Time 1) and Grade 6 (the first year of middle school; 48% female;  $M_{age} = 11.35$ ). Participants were recruited from eight public elementary and three public middle schools in the greater Washington D.C. metro area. The sample was ethnically diverse, with the mothers of participants identifying their children as European American (56%), Asian American (19%), LatinX (10%), African American (8%), or bi-/multiracial (7%). Mothers tended to report being well-educated in this sample, with 9.71% completing high school or elementary school, 24.58% finishing some college or completing a vocational program, 28.22% holding a 4-year degree, 8.68% completing some graduate coursework, and 28.81% holding a graduate degree.

### Procedure

Participants were recruited in their schools to take part in a longitudinal study investigating the social development and relationships of youth as they made the transition from elementary-to-middle school. Data in the current study were collected once each semester across the fifth and sixth grades (i.e., a total of four time points). The primary Grade 5 teachers of these participants also completed measures of interest in this study at Time 1. Parental consent was required for participation (consent rate = 84%) and child assent was obtained at each data collection. Peer nominations were collected on site at each of the participating schools, and teachers completed measures on their own time, returning them to the laboratory by mail. All procedures were approved by the University of Maryland Institutional Review Board and key research

stakeholders either at the school or district level including school principals and district research liaisons.

## Measures

### Callous-Unemotional Traits and Conduct Problems (Time 1)

Teachers completed the Teacher-Child Rating Scale (T-CRS; Hightower 1986) and the Teacher Report Form (TRF; Achenbach and Dumenci 2001) during the first semester (Fall) of 5th grade, and items from these measures were used to create measures of children's CU traits and CP (see Table 1). Both the T-CRS and the TRF are standardized assessments which index children's behavioral and emotional functioning currently or within the last two months. A measure of children's CP was derived as an unweighted mean from the T-CRS following standard procedures for that measure and included the following items: "disruptive in class", "gossips negatively about classmates and peers", "constantly seeks attention", "spreads rumors about classmates and peers", "overly aggressive to peers", and "defiant, obstinate, and stubborn" ( $\alpha = 0.90$ ).

We adopted an approach to assessing CU traits that has become commonplace in the literature by using items which overlap with items from specific measures of CU traits including the Inventory of Callous-Unemotional Traits (ICU; Ray and Frick 2018) and the Antisocial Process Screening Device (APSD; Frick and Hare 2001). Consistent with this approach, a measure of CU traits was derived from the T-CRS and TRF using an unweighted mean of the following items: "does not express feelings", "sensitive to other children's feelings (reverse scored)", "poorly motivated to achieve", and "doesn't seem to feel

guilty after misbehaving" ( $\alpha = 0.68$ ). These items were selected based on their theoretical relation to the construct of CU traits and previous research showing that items drawn from the parent-report Child Behavior Checklist can be used to create a reliable and valid measure of CU traits in early and middle childhood (Bedford et al. 2017; Wagner et al. 2018; Waller et al. 2014a; Willoughby et al. 2011).

Measures of CU traits derived by using items from parent- and teacher-report measures have shown good predictive (Bedford et al. 2017) and discriminant validity (Willoughby et al. 2011), appear to be relatively stable across childhood (Willoughby et al. 2014), and similarly accurate across different informants (Waller et al. 2014a, b). Moreover, the reliability estimates for the current measure of CU traits are consistent with the extant literature (e.g., Bedford et al. 2017; Willoughby et al. 2014). Results from the two-factor CFA indicated that each latent factor had significant variances ( $p < 0.0001$ ) and that all the factor loadings were statistically significant. A chi square differences test,  $\chi^2(1) = 16.83$ ,  $p < 0.001$ , indicated that a two-factor model provided superior fit to the one-factor model, suggesting teachers can reliably differentiate CP and CU traits. The latent variables were moderately correlated ( $\phi_{CU/CP} = 0.33$ ) and the final model fit the data well,  $\chi^2(32) = 90.75$ ,  $p < 0.001$ , RMSEA = 0.07, CFI = 0.99. Factor loadings guided the creation of unweighted means for CP and CU traits which were used in subsequent models.

### Social-Behavioral Outcomes (Times 1–4)

Peer nominations of social behaviors and peer relations were assessed using the Extended Class Play (ECP), a peer

**Table 1** Teacher- and peer-reported items

Peer Reported Extended Class Play Items				Teacher Reported Items	
Aggression	Rejected	Prosocial	Sociable	CU Traits	Conduct Problems
Interrupts others	Mean things said to them	Good ideas	Many friends	Does not express feelings.	Disruptive in class
Loses temper easily	Feelings hurt often	Trustworthy	Everyone listens to	Sensitive to other children's feelings (reversed)	Gossips negatively about classmates and peers
Fights	Trouble making friends	Waits turn	Makes new friends easily	Poorly motivated to achieve	Constantly seeks attention
Spreads rumors	Can't get others to listen	Plays fair	Everyone likes	Doesn't seem to feel guilty after misbehaving	Spreads rumors about classmates and peers
Too bossy	Gets picked on	Helps others	Like to play with others		Overly aggressive to peers (fights)
Teases others	Often left out	Polite			Defiant, obstinate, stubborn
Picks on others	Usually sad Hit or kicked by others				



nomination measure in which participants were asked to pretend to be directors of a class play and nominate classmates for various roles. The ECP measure has been shown to be a reliable and valid assessment of children’s social and behavioral adjustment across elementary and middle school grades using a large community sample (Rubin et al. 2006; Bowker et al. 2006). For example, ratings of children’s aggressive behaviors derived from the ECP are associated with stable patterns of offending across elementary and middle school (Malti et al. 2015) and prosociality assessed by the ECP has been shown to predict friendship quality (McDonald et al. 2011).

In Grade 5 (Times 1 and 2, or the Fall and Spring semesters), participants selected one same-sex and one other-sex peer from rosters of participating classmates for each item. In Grade 6 (Times 3 and 4, or the Fall and Spring semesters), participants wrote in the names of up to three same-sex and three other-sex grade-mates for each item. Such procedural changes were made to accommodate the larger peer group in Grade 6 relative to Grade 5 (i.e., participants changed classrooms, and thus, could be with different peers, for different academic subjects in Grade 6, but remained in a single classroom in Grade 5). Nominations received were first summed, proportionalized, and then standardized within-sex and within-classroom (fifth grade) or within-grade (sixth grade) to adjust for the number of nominations received and the number of nominators (Cillessen 2009). Of relevance for this study, previously published work has shown that the items from the ECP load onto factors assessing (physical and relational) aggression, victimization/exclusion, sociability, and prosociality (Bowker et al. 2006, 2010; Malti et al. 2015). The specific items for each of these particular ECP factors are reported in Table 1. The standardized item

scores for each factor demonstrated good reliability across time-points with Cronbach’s  $\alpha$ s ranging from 0.89 to 0.95.

The possibility that individual latent growth curves would best fit the ECP data across the 5th and 6th grades was investigated prior to examining predictive models. Preliminary latent growth curve models were separately estimated for each of the ECP constructs. Each model, which included residual covariances for adjacent timepoints, demonstrated excellent (i.e., near perfect) fit to the data, likely because they approached being fully saturated,  $X^2(2) = 0.03$  to  $1.07$ ,  $p = 0.58$  to  $0.98$ , CFI = 1.0, RMSEA = 0.03 to 0.001, SRMR = 0.08 to 0.01. The intercept and slope means for each of the ECP dimensions was nonsignificant, suggesting a lack of mean change over time. Moreover, the slope variances for each of the ECP dimensions were also nonsignificant, suggesting that individuals did not systematically vary in the extent to which they demonstrated change in the ECP dimensions across time. This is consistent with findings that within construct correlations between 5th and 6th grade ECP assessments were significant and high (i.e., Aggression,  $r = 0.57$  to  $0.90$ ; Victimization/Exclusion,  $r = 0.54$  to  $0.87$ ; Prosocial,  $r = 0.44$  to  $0.78$ ; Sociable,  $r = 0.55$  to  $0.87$ ). However, the intercept variances for each ECP dimension were significant, suggesting individual variability in average levels of each ECP factor. Because significant variability in change over time was not observed, and given that a primary goal of the current study was to examine associations between CP and CU traits and all four ECP dimensions simultaneously (i.e., accounting for their covariances), a fully latent structural equation model was adopted for the final model. Prior to examining predictive associations, a latent confirmatory factor model was estimated to examine the covariances between latent ECP constructs and model fit. Modification indices guided the inclusion of within grade item covariances for the 6th grade

**Table 2** Estimated means, standard errors, and bivariate correlations of model latent factors and covariates

	1	2	3	4	5	6	7	8	9
1. Sex (Female = 1)	–								
2. Child Age at Time 1	0.01	–							
3. Maternal Education	–0.09	–0.26**	–						
4. Aggression Factor	–0.02	0.03	–0.08	–					
5. Victimization/Exclusion Factor	0.01	0.02	–0.12	0.15**	–				
6. Prosociality Factor	–0.03	–0.03	0.15	–0.18**	–0.12**	–			
7. Sociability Factor	–0.02	–0.01	0.02	0.05*	–0.19**	0.24**	–		
8. Callous-Unemotional Traits	–0.26**	0.02	–0.18	0.20**	0.12**	–0.16**	–0.04*	–	
9. Conduct Problems	–0.13**	0.05	–0.16	0.55**	0.11**	–0.13**	0.03	0.69**	–
Number	376	379	379	379	379	379	379	379	379
Means	0.48	10.24	5.17	0.06	0.02	0.11	0.07	1.49	1.52
Standard Error	0.03	0.04	0.15	0.02	0.03	0.03	0.02	0.13	0.03

\*  $p < 0.05$ , \*\*  $p < 0.01$ , ^  $p < 0.10$ . Reported correlations between manifest variables represent zero-order bivariate correlations. Correlations between latent factors and study covariates were estimated using maximum likelihood estimation. Covariances between latent factors were estimated simultaneously. Average of indicator means and standard errors reported for latent factors

measures only, as well as the covariance between sociability and prosocial items in 6th grade. Factor variances were significant and standardized item loadings ranged from 0.58 to 0.91. The final ECP measurement model fit the data well,  $\chi^2(91) = 326.14, p < 0.001, CFI = 0.94, RMSEA = 0.08, SRMR = 0.06$ .

**Covariates**

Consistent with prior research on CU traits and child outcomes (Bedford et al. 2017; Rehder et al. 2017; Wagner et al. 2015; Waller et al. 2014a, b), model covariates in this study included child age in months, sex, and primary parent’s level of educational attainment. These data were collected at the first assessment and were retained in the final analyses.

**Analysis Plan**

We first used confirmatory factor models to confirm the dimensionality of teacher-rated CP and CU items following guidelines outlined previously in the literature (Willoughby et al. 2011). Next, Structural Equation Modeling was used to estimate a latent factor for each of the peer-rated outcomes using data from each time point (Times 1–4). All models were estimated using Mplus 8.3 statistical software (Muthén and Muthén 2018). Finally, the measurement model was expanded to include Time 1 teacher-rated CP, CU traits, and the covariates as predictors of peer-rated social-behavioral outcomes.

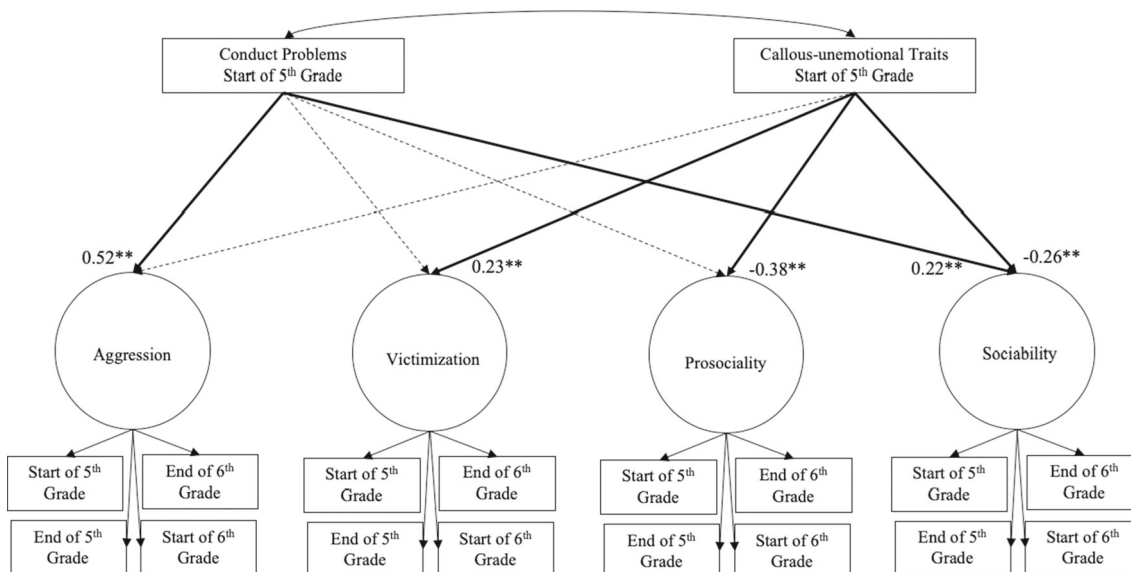
**Results**

**Descriptive Statistics**

Table 2 presents the zero-order bivariate correlations, means, and standard errors for the model covariates and variables of interest. Associations between model latent factors and study variables were estimated in separate models using maximum likelihood in Mplus. Children’s sex (coded as 0 = boys, 1 = girls) was correlated significantly with both teacher-reported CP and CU traits. Peer-reports of aggression and victimization/exclusion were positively correlated with both CP and CU traits. Peer-reports of prosociality were significantly and negatively correlated with CP and CU traits.

**Predictive Models**

The final structural equation model fit the data well,  $\chi^2(153) = 440.24, CFI = 0.94, RMSEA = 0.07, SRMR = 0.07$  (Fig. 1). Teacher-rated CP and CU traits were significantly related,  $cov(CP, CU) = 0.35, p = 0.001$ . Teacher-rated CP at the start of 5th grade (Time 1) was associated uniquely with higher peer ratings of aggression,  $b = 0.51, \beta = 0.52, p = 0.001$ , and sociability,  $b = 0.22, \beta = 0.23, p = 0.002$ , across the 5th and 6th grades. In contrast, teacher-rated CU traits (at Time 1) were associated uniquely with fewer prosocial behaviors,  $b = -0.34, \beta = -0.37, p = 0.001$ , less sociability,  $b = -0.26, \beta = -0.25, p = 0.001$ , and more peer victimization/exclusion,  $b = 0.24, \beta = 0.23, p = 0.003$ , across the 5th and 6th grades (see Table 3). A post-hoc, exploratory multiple group model revealed no difference in the pattern of results between males



Note: Covariances between latent factors and model covariates are not shown.

**Fig. 1** Structural Equation Model Testing Relations between CP and CU traits and ECP Factors. Note: Covariances between latent factors and model covariates are not shown

and females supporting the decision to include child biological sex as a covariate rather than moderator. As such, all study covariates were retained in the final model.

## Discussion

A long history of research on children's peer relationships and social competence has established that the socio-emotional outcomes for children who are able to form and maintain positive relationships with others are more positive and adaptive than those of children who fail at these basic relational tasks (Rubin et al. 2015; Bukowski et al. 2018). One key influence on the formation and maintenance of healthy peer relationships is how children interact with others, and how they are perceived and received by their class- and school-mates (e.g., Pardini and Byrd 2012). Although researchers have explored peer perceptions and reputations of children who have CP, there are few investigations of the peer reputations of children high on CU traits. The current study begins to address this gap in the literature by examining the unique associations between teacher-rated CP and CU traits and peer

reports of aggression, victimization/exclusion, prosociality, and sociability across the 5th and 6th grades. Consistent with extant literature, controlling for CU traits, children's CP was associated positively with peer perceptions of aggression and sociability. Contrary to expectations, children's CU traits were not associated with peer perceptions of aggression after controlling for CP, but were associated positively with being victimized and excluded by peers, and associated negatively with both prosociality (caring, sharing, and helping behaviors in the peer group) and sociability. One notable strength of this study is that it is the first to examine the relations between peer ratings of social behaviors and children's CU traits, *controlling for levels of CP*, during the middle school transition period. Thus, the present study offers new evidence about the associations between CU traits on social-behavioral outcomes during a transition that is oftentimes associated with increased distress and behavioral problems for many youth (Theriot and Dupper 2010).

The significant link between peer perceptions of aggression and teacher-rated CP is not surprising given the conceptual overlap between these two constructs (Campbell et al. 2000; Helseth et al. 2015). Although the links between CP and aggressive behaviors may vary by type of aggression (Helseth et al. 2015) or the maturity of the child's understanding of social relationships (Malti et al. 2015), the current study provides further evidence for the strong links between CP and displays of both relationally and physically aggressive behaviors in a school setting. Although the bivariate association between CU traits and peer perceptions of aggression was significant, this link did not hold when children's CP was included simultaneously in the statistical model. On the one hand, this is contrary to what might be expected given links between CU traits and high sensation seeking behaviors and findings suggesting that youth high on psychopathic traits report more peer conflict (Frick et al. 2014; Muñoz et al. 2008). However, this finding could partially be explained by the fact that the items included in the teacher-reported measure of CU traits in this study primarily assess interpersonal and affective deficits, such as a lack of guilt or emotional display, rather than behavioral offending, such as stubbornness or fighting, which are captured in the measure of CP.

Results showed positive associations between sociability and CP, findings that are consistent with research linking CP with extraverted and outgoing personality characteristics (Jones et al. 2011). Unlike previous research linking aggressive behaviors to peer rejection at younger ages (Lansford et al. 2010), the current study did not find links between children's CP and peer victimization and exclusion. In part, this could be due to emerging links between aggressive behaviors and perceived popularity in middle and high school (Bowker et al. 2010; Schwartz et al. 2006), which may also help to explain the observed links between CP and both aggression and sociability. This finding is also partially consistent with

**Table 3** Standardized parameter estimates for the full structural equation model

	$\beta$	SE	<i>P</i> Value
Aggression on			
Sex (Female = 1)	0.09 <sup>^</sup>	0.07	0.081
Child Age	0.04	0.15	0.618
Maternal Education	0.05	0.05	0.611
Callous-Unemotional Traits	0.07	0.07	0.335
Conduct Problems	0.52**	0.06	0.001
Victimization/Exclusion on			
Sex	0.07	0.08	0.240
Child Age	0.06	0.18	0.611
Maternal Education	0.01	0.06	0.966
Callous-Unemotional Traits	0.23**	0.08	0.003
Conduct Problems	0.05	0.07	0.508
Prosociality on			
Sex	-0.10 <sup>^</sup>	0.07	0.088
Child Age	-0.08	0.13	0.392
Maternal Education	0.06	0.04	0.556
Callous-Unemotional Traits	-0.37**	0.07	0.001
Conduct Problems	-0.01	0.06	0.890
Sociability on			
Sex	-0.03	0.08	0.551
Child Age	-0.02	0.14	0.863
Maternal Education	0.03	0.05	0.751
Callous-Unemotional Traits	-0.25**	0.08	0.001
Conduct Problems	0.23**	0.07	0.002

\*  $p < 0.05$ , \*\*  $p < 0.01$ , <sup>^</sup> $p < 0.10$

research showing that highly aggressive youth in the 4th to 7th grades do not differ from typical peers in terms of being isolated or rejected within social networks (Cairns et al. 1988). Additionally, it might be due to the assessment of different constructs. Peer rejection reflects active dislike (by many peers) whereas our assessment includes items pertaining to peer victimization and exclusion (or being left out and isolated by the peer group). Although related, research also shows that not all youth who are rejected by their peers are also victimized (and excluded; and vice versa; Rubin et al. 2015). Thus, it may be that youth with CP are disliked by peers, but not necessarily left out or picked on, perhaps because they are not perceived as vulnerable (to would-be bullies). If replicated, such information could prove useful when developing interventions for youth with CP (e.g., it might be best to target peer rejection rather than peer victimization/exclusion).

The most notable findings, however, pertained to CU traits. For example, the significant links between teacher-rated CU traits and lower peer ratings of prosocial behaviors is consistent with literature identifying limited prosociality, or a lack of kindness, as being a core feature of CU traits in children (Kimonis et al. 2014; Waller and Hyde 2018). The observed negative association between CU traits and prosocial behaviors also aligns with recent work demonstrating relations between parent- and teacher-reported CU traits and teacher-reports of children's difficulties with prosocial behaviors (Milledge et al. 2018). Furthermore, findings in the current study are consistent with developmental literature emphasizing the role of empathy and guilt which often motivate proactive or reactive responses to the needs of others (Eisenberg and Fabes 1990). Indeed, deficits in empathy, guilt, and prosociality are central to our understanding and measurement of CU traits (Kimonis et al. 2015; Waller and Hyde 2017), and the current findings suggest that these links are also apparent to peers across the transition from elementary to middle school.

Results further suggest increased CU traits in 5th grade predicted increased peer victimization and exclusion across both 5th and 6th grades, suggesting that the interpersonal and affective deficits associated with CU traits are related to peer exclusion and victimization during the transition from 5th to 6th grades. Why might this be the case? Additional research is clearly needed, but it is possible that children with CU traits are viewed as untrustworthy peers with whom youth would prefer not to include in group activities. In addition, given that CU traits were associated negatively with sociability (as discussed in greater detail below), it seems plausible that children high in CU traits may be viewed as “outsiders” without the social support of peers, and thereby, relatively “easy” targets for peer victimization/exclusion. These results are partially consistent with research suggesting that CU traits are associated with combined bullying and victimization in adolescence (Fanti et al. 2009). Drawing from research suggesting

that deviant peers also act quite aggressively toward their friends (Dishion et al. 1995), it could also be possible that youth high on CU traits experience victimization and exclusion within a deviant peer group, experiences which can become more frequent if reinforced (Snyder et al. 2007) and set the norm for interpersonal relationships (Bukowski et al. 2008). Regardless of the reasons for victimization and exclusion, however, youth who are exposed to negative peer experiences are less likely to experience prosocial forms of socialization (e.g., Etekal and Ladd 2014). Over time, children who are repeatedly left out, victimized, and rejected by peers may form a reputation within their peer group that is maintained, even as they enter new grade levels (Bukowski et al. 2018). Thus, the present findings suggest that teachers, counselors, and clinicians may do well to pay increased attention to the peer difficulties of children high in CU traits as they may be a strong contributing factor to increasing behavioral and social difficulties over time.

Research on the social correlates of psychopathy, for which CU traits is a risk factor (Barry et al. 2000), emphasizes the roles of superficial charm, manipulation, and grandiosity in relationships (Hare and Neumann 2008). Indeed, factor analytic studies of psychopathy measures consistently show a distinct factor that captures harmful social and personality features such as shallow affect, deceitfulness, and manipulation (Neumann et al. 2006). These social correlates of psychopathy are carried over in a variety of measures of CU traits which combine the psychological and harmful personality features associated with psychopathy into a subtyping approach for antisocial behavior that was tailored for use with younger populations (Frick and White 2008; Waller and Hyde 2017). In fact, these ideas were reflected in the inclusion of an “undersocialized aggressive” subtype of child conduct disorder that appeared in the DSM-III, which characterized a failure to maintain social relationships and the exploitation of others (Pelham et al. 1992). This literature might suggest that peers would perceive those individuals high on CU traits as sociable, but lacking in other areas such as being helpful and caring in the peer group. However, the current study found that teacher-ratings of CP were associated positively with peer-rated sociability, but that teacher-ratings of CU traits were associated *negatively* with peer perceptions of sociability.

The finding that youth high on CU traits are less sociable, that is, they are viewed as not having many friends and not making friends easily, is not entirely inconsistent with a downward extension of research on the social correlates of psychopathy. Recent work by Viding and McCrory reviews evidence suggesting that a core feature of individuals with psychopathy is their reduced motivation and capacity to develop authentic social relationships (Viding and McCrory 2019), which is also consistent with research on the very early social and affiliative correlates of later CU traits. Specifically, existing research on the relational aspects of CU traits



demonstrate their association with specific patterns of socioemotional, interpersonal, and affective functioning (Blair 2013; Frick and White 2008) which may undermine the formation of healthy affiliative social bonds (also see Waller and Wagner 2019). For example, CU traits in childhood are associated with decreased preferential face tracking (relative to tracking of a red ball) at 5 weeks (Bedford et al. 2014), less eye-contact during face-to-face interactions with caregivers at 6 months (Bedford et al. 2017; Wagner et al. 2016), lower expressions of physical and verbal affection for parents at 18 months (Waller et al. 2016), less imitation of the social behaviors of others in toddlerhood (Wagner et al. 2020), and less positive affect and mutually responsivity with parents at ages 3 to 4.5 years (Kochanska and Murray 2013).

Social and interpersonal behaviors such as attention to emotional faces, eye contact, reciprocal smiling and warmth are present from birth and are thought to play a critical role in facilitating affiliative interactions and social bonding with caregivers (Kuchuk et al. 1986). In addition to the research examining the early social and affiliative deficits associated with CU traits, there is also evidence linking CU traits with reduced behavioral and neurophysiological response to the emotional displays of others (Lockwood et al. 2013). Whether this growing body of research, and the current findings, suggest that CU traits are associated with some degree of social disinterest or reduced affiliative motivations remains an open question. However, extant evidence seems to suggest that many of the core social and interpersonal deficits associated with CU traits are present early in life which, when taken together with the current findings, likely has cascading consequences for the formation and maintenance of social relationships across development.

The current study is the first to examine peer perceptions of the social-behavioral correlates of CU traits and, when taken together with research using adult-reports of social behavior, the findings suggest both consistencies and inconsistencies in how peers perceive the correlates of CU traits as compared to parents or teachers. Findings that peers perceive youth high on CU traits as being less prosocial and more victimized than youth low on CU traits is consistent with existing literature on the behavioral and social correlates of CU traits. However, teacher- and parent-ratings of psychopathic qualities or CU traits in older samples suggesting links with manipulateness or grandiosity do not align with the current findings that youth high on CU traits are viewed as being less sociable than peers who are not high on CU traits. However, future research is needed to assess whether these findings are consistent with literature linking later CU traits with early deficits in affiliative behaviors, which would suggest the possibility that youth high on CU traits prefer solitude.

While the current study is characterized by a number of strengths, including the use of a paradigm that allows for the assessment of peers' perceptions of social behaviors,

measurement of these perceptions across the transition from elementary to middle school, and the implementation of a structural equation modeling approach to examining study hypotheses, the study, itself, does have several limitations. First, the current study cannot test potential bidirectional associations between CU traits and peers' perceptions of social behaviors. Research demonstrates bidirectional links between CU traits and parenting behaviors (Waller et al. 2014a, b) and student-teacher relationship quality (Baroncelli and Ciucci 2019), and that peer victimization at ages 8 and 10 predict CU traits at age 13 (Barker and Salekin 2012a, b). There is clear potential for reciprocal relations between peers' perceptions of social behaviors and CU traits and, in particular, transactional links between peer victimization/exclusion and CU traits. Future research should assess both CU traits and peers' perceptions of social behaviors longitudinally to address this gap. Similarly, the extent to which peers' perceptions of social behaviors map onto actual behaviors was not examined. Research that implements observational approaches to examining these questions should be pursued.

Third, it is worth noting that the overlap in content between teacher-rated CP and peer-rated aggression likely contributes to the strong bivariate and predictive relations. Moreover, while the inclusion of both teacher-rated CP and CU traits as covarying predictors is necessary given their positive association, it is also likely that the observed relations between them and the peer-rated social-behavioral outcomes is due to suppressor effects. That is, conclusions regarding the shared versus unique associations between CP and CU traits and study outcomes should be made under the assumption that the inclusion of one predictor may increase the predictive validity of the other predictor (MacKinnon et al. 2000). Fourth, the consequences of CU traits for peer functioning may depend on the extent to which children are interacting with familiar or unfamiliar peers. For example, youth high on CU traits seem to care less about the distress and suffering of others (Pardini and Byrd 2012), but processes of guilt and empathy for psychopathic individuals have been shown to vary by the extent to which individuals are members of the same social group (Arbuckle and Cunningham 2012). As such, the processes of interest in this study may vary based on the extent to which children are familiar with the individuals with whom they are interacting.

Those children who are involved in early role play and interpersonal conflict resolution acquire perspective- and role-taking skills and demonstrate socially competent behavior (Damon and Killen 1982). There is strong evidence that peers are of central importance to children's success in school, and that children who are able to engage in positive activities with peers tend to experience levels of emotional well-being and positive self-perceptions that are stronger than those children who may not have such peer competencies (Rubin et al. 2015). Elucidating how key social behaviors are perceived by

peers during this important transitional stage will provide a foundational insight into these important relationships for children high on CU traits, and could perhaps have important implications for clinical intervention efforts with children high on CU traits. Indeed, although additional research is clearly needed, our findings may suggest that social skills training and other interventions may best target socially competent behaviors (sociable behaviors, prosocial behaviors)—rather than aggressive behaviors – which children with CU traits appear to be lacking.

**Acknowledgements** The research reported in this manuscript was supported by a grant from the National Institutes of Mental Health (R01-MH58116) awarded to Kenneth H. Rubin.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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